MONEY-MATICS

EXPLORING FINANCIAL EDUCATION IN THE PRIMARY MATHEMATICS CURRICULUM

Supported by

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CONTENTS

INTRODUCTION

This resource is part of the Money-Matics project which has been generously funded and supported by Nationwide Building Society.

 Research shows that we form our financial attitudes early, often by the age of seven, and so the importance of developing young people's attitudes towards money early on in life is crucial.

The aim of the project was to explore whether using personal finance as a context to learning could enhance the engagement and attainment of primary school pupils in mathematics.

Starting in the 2015/2016 academic year, Year One of the project involved 12 primary schools within Greater London. These schools received training and support to develop lessons which would help to embed appropriate financial contexts into relevant areas of their mathematics curriculum over the course of one academic year.

The results from the first year of the project proved very promising, with all participating schools showing an increase in overall pupil attainment from the pre to the post intervention tests. The Average pupil attainment increase was 18%, indicating that supporting teachers to find creative ways of including financial contexts in their maths lessons positively contributes to pupil progress.

Year Two of the project began in the autumn term of 2016, this time working with 7 primary schools in Swindon. These schools will receive the same support and intervention over the course of an academic year in order to create a range of lessons which will help embed financial contexts into their mathematics curriculum; we hope to see the same success with this group of schools and to develop additional ideas for using money related contexts to support the teaching of mathematical concepts.

The purpose of this resource is to explore the ways in which schools approached the subject of financial education and how this was included in primary maths lessons, with the aim of inspiring other primary teachers to include some of the learning in their own classrooms.

The resource consists of a range of case studies from teachers involved in Year One of the project and aims to provide practical ideas to allow others to replicate their successes. Further activity ideas illustrate additional ways in which these can be delivered, together with exam style questions that can be used to measure pupils' progress.

To find out more about the project, please see our dedicated project page here: **www.y-e.org.uk/money-matics**

ACKNOWLEDGEMENTS

ABOUT THIS RESOURCE

This resource has been organised into four overarching sections covering the following mathematical topics at Key Stages 1 and 2:

1	GEOMETRY & MEASUREMENT
2	NUMBER
3	STATISTICS
4	ALGEBRA

EACH SECTION INCLUDES:

CASE STUDIES
Exploring how schools included and developed financial education skills in the classroom through mathematical topics.

ACTIVITY IDEAS
A range of suggested activities that use a variety of financial contexts and can be used in the classroom with options for different learners.

ASSESSMENT OPPORTUNITIES – Test style questions to use with pupils.

Topic	Case Studies	Activity Ideas	Assessment Opportunities
GEOMETRY & MEASUREMENT	KEY STAGE 1 – Bargain Hunting! KEY STAGE 2 – Deal or No Deal	KEY STAGE 1 KEY STAGE 2	KEY STAGE 1 KEY STAGE 2
NUMBER	KEY STAGE 1 – Let's role-play! KEY STAGE 2 – Planning your birthday party	KEY STAGE 1 KEY STAGE 2	KEY STAGE 1 KEY STAGE 2
STATISTICS	KEY STAGE 2 – Covering all bases	KEY STAGE 1 KEY STAGE 2	KEY STAGE 2
ALGEBRA	KEY STAGE 2 – Money doesn't have to be a problem!	KEY STAGE 2	KEY STAGE 2

ABOUT THIS RESOURCE

Financial mathematics and financial education

The national curriculum for mathematics aims to ensure that all pupils;

- become fluent in the fundamentals of mathematics
- reason mathematically
- can solve problems by applying maths to a variety of routine and non-routine problems

The Mathematics Programmes of Study at Key Stages 1 and 2 cover a range of topics, including:

Number – Number and place value

Number – Addition and subtraction

Number – Multiplication and division

Number – Fractions

Measurement

Geometry – Property of shapes

Geometry – Position and direction

Statistics

Algebra

Ratio and proportion

Most topics are introduced and built upon from Year 1, however algebra, and ratio and proportion are usually introduced during Year 6.

Financial education helps children to develop skills, knowledge and attitudes around money, preparing them for the opportunities, responsibilities and experiences of life. Preparing children to become financially capable is an essential part of their education, ensuring that they have the confidence to manage their money effectively and that they are able to make appropriate decisions once they are adults.

Managing one's finances is more than just being able to 'do the maths', it is also about understanding that the decisions we make about money, and our attitudes to the things we can do with it (e.g. spending, saving, borrowing, lending and investing,) will have an impact on our financial security in adult life.

Providing children with the opportunities to handle and manage money provides excellent real-life situations within maths lessons. Exploring financial terminology such as budgets, interest, credit and debt, and considering how we behave with money e.g. understanding our needs and wants and knowing that we might not always be able to have everything we want, are equally important and should be introduced along-side financial mathematics.

The Financial Education Primary **Planning Framework; www.y-e.org.uk/primaryplanningframework**, will help schools plan for financial education in the classroom.

GEOMETRY & MEASUREMENT

AND THE CONTEXT OF MONEY

The study of geometry and measurement enables children to make connections with their everyday physical surroundings.

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Geometry helps us to measure and understand the spaces and shapes around us, making it a practical guide for recognising, describing and comparing lengths, areas and volumes. Developing pupils' knowledge of two and three-dimensional shapes leads to an increased ability to reason spatially, to visualize objects and eventually use geometry to solve a range of problems.

Measurement aims to quantify the physical environment, making the link between arithmetic and geometry. Learning how to measure and compare lengths, weights and the capacity of various shapes are key skills and have many practical applications in terms of the financial decisions we make, such as buying carpet or paint, or comparing prices.

In learning about geometry and measurement children have the opportunity to solve problems that directly relate to 'real-life' issues involving calculating costs and using money e.g.:

- recognising the different shapes and sizes of the coins (perimeter and area) and if this is representative of the 'value' of the coin, e.g. the perimeter and area of a 2 pence coin is larger than a 5 pence coin, however it has a lower denomination

- the varied mass of coins and how this relates to recognition of coin denominations, for example a £2 coin is much heavier than a 20p coin

- solving problems in a practical context such as weighing ingredients for baking a birthday cake.

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CASE STUDY 1
BARGAIN HUNTING!

One of the 12 primary schools involved in Year One of the project taught wanted their Year 2 pupils to develop skills around explaining and evaluating their spending choices, so they were sent on a bargain hunt!

The objectives:

- to use and recognise different coins

- to develop an awareness that different shops can sell the same items at varying prices

What they did:

The aim of the lesson was for pupils to experience money in a real-life situation so that they could start to develop an understanding of the concept of value.

As part of a PSHE lesson, pupils completed a 'needs and wants' card sorting activity, where they had to decide whether an item, for example a mobile phone, was a need or a want. This promoted lots of discussion as pupils had to justify why they had made their choice.

The teacher was aware that a lot of pupils enjoy 'playing shop' so this concept, with a clear mathematical focus, was used for the basis of the lesson. To begin, pupils had the opportunity to play with money; they counted using coins, they chose coins to make particular amounts, and then made the same amount using different coin denominations.

Pupils were challenged to find different ways to make the same sum of money using coins, for example making 22p using 10p, 10p and 2p, or 20p, 1p and 1p. Using a range of visual resources that included images of snacks or fruits with set prices engaged the pupils further.

Finally, to bring all of these skills together three shops were created; each sold the same items but at different prices. Working in pairs and using a shopping list, pupils had to find out which shop offered the cheapest deal for each of the individual items, and which shop offered the cheapest deals overall. This allowed the pupils to move freely around the classroom, complete a table and use the language of 'cheap', 'expensive' and 'value'.

The following week the pupils wanted to 'play shop' again, but this time they had to pay for their goods with coins, and work out the correct change they would receive themselves before they were given their change from the shopkeeper.

Shopping engages pupils in real-life money related experiences and pupils responded well to this activity. Feedback showed pupils enjoyed the role-play, working with a partner and figuring things out for themselves. The tills also amazed several pupils!

"I liked talking with my partner and taking turns and deciding where to go."
Year 2 pupil

CASE STUDY 2
DEAL OR NO DEAL?

London Fields Primary School, Hackney, gave their Year 4 mixed ability pupils the task of comparing a range of different products with the aim of encouraging them to become critical consumers.

The objectives:

- to calculate unit prices

- to appreciate that some offers are not all that they seem

What they did:

Every day we see special offers that claim to save us money through advertising in shops, on TV and online. In this task, the pupils had to make comparisons about a range of goods with varying offers, and then decide which deal was best 'value for money'.

To start the activity pupils were encouraged to discuss the different types of offers they had seen, completing a thought-bubble to demonstrate their knowledge. Some responses included 'buy one get one free', '3 for 2', and 'buy one get one half price'.

Then pupils looked at photographs of different offers as a stimulus for discussion; some offers would save the buyer money, and others wouldn't! For example, a large tub of margarine priced at £3.25 or an offer of 2 tubs for £5, and a pack of bread rolls costing 40p or 2 packs on offer for £1. Using the cost of the multi buy offers, pupils estimated and then calculated the price of one product to compare with the pre-offer price.

Pupils went on to consider the quantity of some products versus price and considered 'value for money'; for example, a 250g pack of digestive biscuits costing 89p, a 500g pack costing £1, and a 1,000g pack costs £1.89. The pupils discussed which pack gave the best 'unit price' and which they considered to be best value, further discussion could involve other factors that contribute to best value, such as brand and quality and if you would be able to eat a kilo of biscuits before they went stale!

Some pupils were able to investigate additional offers introduced on these items, for example; a 'buy one get one free' offer on the 500g pack of biscuits, and were then tasked to decide which of the three packs now offered the cheapest unit price and if they thought this was also best value. Pupils had to explain and justify their choice, developing their ability to act as critical consumers. Through discussion, pupils also began to understand that an offer is only good value for money if the item is actually needed and will be used, there is no advantage in buying large quantities of food, for instance, if you won't be able to eat it all before it goes off.

In a following session, pupils researched the prices of items that they would like to buy e.g. toys, games, favourite foods and developed their own special offers for these that would be good value for money.

> "Now I know that an offer is not always good for you. Also sometimes even if it is very cheap, but if you don't need it, don't buy it."
>
> Year 4 pupil, London Fields Primary school

ACTIVITY IDEA...
LANDSCAPE GARDENER
KEY STAGE 2

Learning outcome:

- to calculate the total cost of fencing a garden

- to know that we may have to amend our choices depending on cost

Ask pupils to take on the role of a 'Landscape Gardener', and to design a garden within a certain budget - in this case a garden with an area of 100m².

The owner would like a new fence around the garden, but won't pay more than £600 for the fence panels and posts. Can they work out if this is possible?

To begin, ask pupils to draw their gardens on squared paper considering what the dimensions could be.

Task pupils to use the internet to research the cost of the fence panels and posts, or work out the cost using the following prices:

- £20 per panel measuring 2m wide and £10 per fence post measuring 10cm wide

- £21.50 per panel measuring 1.8m wide and £9.99 per fence post measuring 12cm wide

Ask pupils to consider the following questions;

- How many fence panels and fence posts are required? (Pupils may need to be reminded that they need to include the width of the posts as well as the panels in their calculations.)

- Can they buy the fencing and posts within the £600 budget?

- Does the cost of the fencing vary if the dimensions of the garden are different? e.g.: a 20m by 5m garden?

- As well as working out how many panels and posts are needed and the total cost, ask pupils to consider why we need to work out how much something might cost before we buy.

Task pupils that are more able to add in extra items such as the following:

- Include a rectangular lawn on their plan and work out the total cost of turf based on costs of either £5 or £5.99 per square metre, or research actual costs online

- Include a paved section in their garden and work out the cost of using paving slabs based on the following prices: 45 cm² slabs at £4.99 each, or 50 cm² for £5 each, or research the costs of actual slabs online

- Research the cost of a bench, trees, a greenhouse or shed to further enhance the garden.

Finally, challenge these pupils to write a quote for the garden design.

ACTIVITY IDEA...
MASSES OF COINS
KEY STAGE 1

Learning outcome:

- to recognise and understand the value of different coins

- to recognise that the value of a coin is not necessarily dependent on its relative size or weight

Show pupils three cloth bags each of which contain an equal number of coins. One bag could have ten 50p coins, another ten £1 coins and another ten 2p coins. Pupils should not be able to see the coins in the bags. To differentiate use just two bags, or a smaller number of coins.

Next, ask the pupils to measure the mass using weighing scales to find out the weight of each of the bags, and consider if there is a way of finding out which bag contains which coins. Which bag of coins do they think holds the most money? Do they think all coins weigh the same?

Pupils could investigate whether the heavier the coin, the higher the monetary value of the coin. Ask pupils to measure the mass of individual coins or use the table below.

Using this information, and remembering that there are an equal number of coins in each bag, now ask the pupils to investigate which denomination of coins are in each bag. If further guidance is needed you could let pupils know how many coins there are in each bag.

This activity can be repeated using different coin denominations such as 2p, 5p and £2, or by placing different numbers of coins in the bag.

Higher ability pupils could be further challenged by working with bags which contain equal numbers of mixed coins, for example a bag containing ten 2p coins and ten 5p coins, and a bag containing twenty £1 coins. Both bags contain 20 individual coins, but one bag contains ten lots of two different coin denominations, can they work out what denomination coins they are?

Use this activity to explain why coins need to look and feel different in order that we can recognise them easily, but that size and weight do not necessarily relate to the value of the coin.

Coin	1p	2p	5p	10p	20p	50p	£1	£2
Mass	3.56g	7.12g	3.25g	6.5g	5g	8g	8.75g	12g

ACTIVITY IDEA...
CHOCOHOLIC!
KEY STAGE 1

Learning outcome:

- to appreciate that other people may make different spending choices to me

- to know that price is not the only thing to consider when considering 'best value'

Show pupils ten different chocolate bars found in most shops – these could be actual bars or photographs. Ask pupils to share which chocolate bar is their favourite and why. Discussion could be extended to include how much their chosen bar costs and how often they buy it. Next ask pupils to consider which bar they think is the best value for money?

Split pupils into groups, giving each group one of the chocolate bars, and ask them to research the price of the chocolate bar online making a note of the weight of the packet. Share their findings with the whole class.

Next, ask pupils to consider which of the 10 bars of chocolate is the cheapest? Which chocolate bar weighs the most? Is it the same bar?

Ask the pupils to calculate how many grams of the chocolate bar they get for every penny spent, or they could calculate how much 10 grams of the chocolate bar costs – now compare which bar has the cheapest unit price?

**Differentiate this activity by drawing comparative bar charts for price and weight of the chocolate bars.**

Which bar do they think represents 'best value'? Is best value always the cheapest? There is no point in buying the cheapest if no one likes to eat it! What other things influence our choices? You could explore ideas such as personal taste, advertising, what our friends and families like and so on.

To extend this activity, pupils could repeat the above using different special offers they have seen in supermarkets or online, such as 3 for 2 offers, buy one and get one for half price. For each they will need to first work out the price of one bar of chocolate (for example, buy one and get one for half price is the equivalent of 25% off each bar of chocolate), before identifying which offer represents best value for money.

GEOMETRY AND MEASUREMENT AT KEY STAGE 1 AND KEY STAGE 2

ACTIVITY IDEA...
REDECORATING
KEY STAGE 2
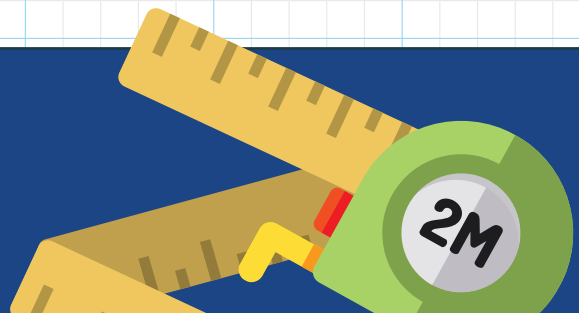
Learning outcome:

• to use a range of data to calculate and compare prices

Ask pupils to imagine that they are redecorating one of the rooms in their house. How might they calculate the right amount of carpet to buy for a room?

Task the pupils to work out the cost of buying a new carpet. Ask them to imagine that the classroom is their lounge - guide them to measure the classroom considering the units of measurement they would use.

Ask the pupils to think about what other items, other than the carpet itself, they would need?

This could either be researched online, in class or could be a given as a homework task. Through questioning with pupils, agree that most carpets require;

• Underlay; usually made of foam and used for protection and support of the carpet

• Delivery of the carpet, underlay and gripper rods

• Gripper rods; made of a thin piece of wood, studded with sharp nails and used to grip the carpet so it does not move, these are generally nailed to the perimeter of the room

• The time costs for someone to fix the carpet in place

Pupils need to calculate the best value for money from the following options all of which provide a similar quality of carpet:

This activity could be differentiated by changing the carpet and underlay costs or by using just two options and more simple numbers.

Pupils can repeat the value for money calculation using special offers for each one such as; 25% off the carpet price, free fitting, free underlay, 15% off the carpet and underlay respectively for each option – or also repeat after measuring their own lounge at home!

OPTION 1

Carpet costs £35 per m^2
Free carpet underlay
Free gripper rods
Free fitting
Delivery costs £15

OPTION 2

Carpet costs £22 per m^2 for the first 25 m^2 then £8 per m^2
Carpet underlay costs £4.50 per m^2
Free gripper rods
Fitting costs £50
Free delivery

OPTION 3

Carpet costs £16.50 per m^2
Carpet underlay costs £5.99 per m^2
Gripper rods 57p per 1.52m
Fitting costs £30 if room bigger than 30m^2, otherwise free
Delivery costs £15

OPTION 4

Carpet costs £16 per m^2
Carpet underlay costs £6.99 per m^2
Gripper costs cost £5.21 for 8 lengths of 1.52m
Fitting costs £25
Free delivery

GEOMETRY AND MEASUREMENT ASSESSING LEARNING THROUGH KS1 TEST STYLE QUESTIONS

Q1 Match each coin to the correct box.
One has been done for you.

Less than	Match each coin to the correct box	More than
	One penny (1)	
	Two pence (2)	
	Five pence (5)	
	Twenty pence (20)	
	Fifty pence (50)	

Q2 Anneka has some coins in her purse.

(a) How much money does she have?

[ ] p

(b) Anneka spends 20p.
How much does she have left?

[ ] p

Q3 Gilda has just two coins in her purse.

23p   **20p**   **25p**

22p   **26p**

Tick (✔) all the amounts she could have in her purse.

Q4 Stef buys some food to eat.

70p   **40p**   **50p**   **30p**

He buys two different items. He spends **£1** altogether.

Tick (✔) the two things that he buys.

Q5 Hamza buys a pen for 80p

(a) Tick (✔) **three** coins to show how Hamza can make **80p**

(b) Tick (✔) **five** coins to show another way to make **80p**

Q6 Jana has £10.

£2.35

She buys two books for £2.35 each.
How much money does she have left?

£

Q7 Chen and Sally share this money equally.

How much do they each get?

p

GEOMETRY AND MEASUREMENT ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q1 Tomek wants to buy some cheeses.
Below are some prices of different cheeses.

Cheddar Cheese	Edam Cheese	Cottage Cheese
82p for 100 grams	66p for 100 grams	45p for 100 grams

Tomek buys 250g of Cheddar and 50g of Edam cheese
How much does he pay altogether?

Show your working...

£

He also buys some cottage cheese for £1.80.
How many grams of cottage cheese does he get?

g

Q2 One kilogram of silver costs £476.57
What is the cost of one gram of silver rounded to the nearest penny?

Show your working...

£

Q3 The table below shows the journeys made by a taxi driver in a morning.

Journey number	Start time	Number of passengers	Distance	Cost
1	8.15	3	7km	£7.20
2	8.40	1	16km	£12.80
3	9.30	2	6km	£6.80
4	9.50	1	25km	£18.00
5	11.10	2	15km	£11.90

On journey 1, the passengers shared the costs equally.
How much did each passenger pay?

£

How many passengers made journeys of more than 10km?

passengers

Journey number 4 took 55 minutes.
What time did the taxi driver finish their journey?

am

If journey number 4 took 55 minutes.
Estimate how long journey number 5 would take.

Explain your answer...

....

....

....

....

GEOMETRY AND MEASUREMENT ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q4 The mass of a 10p coin is 6.5g.
The mass of a 5p coin is half the mass of a 10p coin.

What is the mass of these 6 coins altogether?

✏ Show your method...

g

Q5 Sumi does a sponsored walk to collect money for charity.
Her elder brother promises to pay 85p for every kilometre she walks.

(a) Sumi walks 9,000 metres.
How much money should her brother pay?

(b) Sumi's neighbour pays her £6.75 at the end of the walk.
How much had Sumi's neighbour promised to pay per kilometre?

(c) 18% of the people walk 5km or less. 42% of the people walk 7km or more.
What percentage of the people walk between 5km and 7km?

%

Q6 A 5p coin has a diameter of 1.8 centimetres.

1.8cm

Mr Stephens' class are making a straight line of 5p coins in the school hall.
So far they have collected £100 worth of 5p coins.

How long is the line?
Give your answer in metres.

✏ Show your method...

m

Q7 Miss O'Brien is making jam.
Raspberries cost £10 per kg.
Sugar costs 69p per kg.

The recipe requires 1200g of raspberries and 1000g of sugar.
Calculate the cost of the ingredients.

✏ Show your method...

£

NUMBER

AND THE CONTEXT OF MONEY

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Number problems are often set in a context that naturally involves money. Showing a problem and developing the skills needed to solve that problem in context is more engaging for pupils than teaching the skills without it. The context allows pupils to see a purpose for the learning, and in turn they become more engaged which can enhance their understanding.

Many teachers use the context of money to help pupils develop a better understanding of the rules of number, decimals, fractions, percentages, and later ratio and proportion.

The curriculum highlights the requirement for pupils to solve problems with money, and to facilitate this in a real-life context we could ask pupils to research:

• the cost of posting a letter or a parcel

• comparing and assessing various savings accounts, which pays the most interest and how much interest would you earn over different periods of time

• comparing various sizes of products such as milk cartons or chocolates biscuits and calculating value for money.

These tasks lend themselves to using concrete resources such as coins and receipts, all of which are essential in preparing pupils for managing money in adult life.

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CASE STUDY 1
LET'S 'ROLE-PLAY!'

St. Stephen's CE Primary School in Hammersmith and Fulham planned for their Year 1 class to apply their mathematical knowledge to some real-life scenarios, so they developed a range of 'role-play' situations creating some maths in action!

The objectives:

- to recognise coins and develop confidence in counting and handling money

- to calculate the total cost of items to be bought, and to appreciate that they may not always be able to afford everything they want to buy

What they did:

To start with the pupils were given role-play scenarios to act out. For example, 'My purse is too heavy; it contains 54p in 1p coins! What can I do?' Pupils chose props and acted out the scene.

The role-play process encouraged pupils to engage with the mathematical problems, and to put themselves in the given situations.

Pupils then represented the scenarios by drawing a 'maths picture' and considered questions such as Why don't we just have 1p coins? Why do we have other values of coins? Why do we have bank notes? Which coin or note would be good to have and why?

After their role-plays, pupils could swap their original props for mathematical equipment such as counters. This encouraged pupils to think of the scenario as a mathematical problem that could be written on paper as a sum. The focus was on reading and understanding worded maths problems as 'real-life problems' and thinking about the steps to solve them.

To start with the pupils recapped on partitioning 2-digit numbers into tens and ones, and once confident with counting the pupils played 'bankers' sorting 10p and 1p coins into different groups and exploring how 'much' each was worth; they had to exchange ten 1p coins for a 10p coin and ensure that they were not being short changed or tricked! Some pupils explored exchanging other denominations such as 2p, 5p and even £5 notes.

Next they recapped on partitioning 2 or 3 digit amounts. The pupils exchanged 100p for a £1 coin and discussed what each was worth; some thought the £1 coin would be worth the most as it was gold!

The pupils practiced counting out the 2 or 3 digit amounts of money using £1, 10p and 1p coins to partition into hundreds, tens and ones.

Using further role-play, they then opened their own 'Paddington Café' and sold a range of drinks and snacks using 2 or 3 digit prices and using coins to find the total price of the things they bought.

A further scenario for the café was introduced, the pupils were asked to buy a drink and snack for lunch, but they only had a given amount of money to spend so they had to find out which options they could afford to buy. They were encouraged to consider a number of questions such as; Which is the most expensive option? Which would you like to buy and why? Which do you think is the best value? Do you think the prices are fair, for example should a chocolate croissant cost £20?

The final activity recapped on simple multiplication and division by grouping and sharing. Pupils shared their own experiences where they had encountered these skills, for example buying food. They then read a range of maths questions and highlighted key information, such as 'I need 18 balloons for a party, and these come in packs of 5. How many packs do I need to buy?' Pupils considered questions such as; Does it matter if you have too many? Why can't you just take 3 more out of one of the packs?

The process allowed the pupils to become increasingly confident in switching between the concrete and the abstract, and recording their thinking on paper. Confidence in solving problems improved as pupils began to imagine themselves in the situations and think about what they would do in order to solve the problem.

"If you act it out and pretend it's real then you don't get confused about all the numbers..."

Year 1 pupil, St. Stephen's CE Primary School

CASE STUDY 2
PLANNING YOUR OWN BIRTHDAY PARTY

One of the 12 primary schools involved in Year One of the project decided to teach money skills to Year 5 pupils using the context of birthday parties. The teacher wanted to create an exercise that allowed pupils to handle money as many did not have much experience of taking part in the transaction process, and some did not know the different denominations of the coins and notes used within this country.

The objectives:

- to plan a party within a given budget and make adjustments when necessary

- to appreciate that own brand or multi-buy offers can make money go further

What they did:

Pupils were asked to plan the food and drink needed for a birthday party for the class (30 guests) on a given budget. As a reward for staying within their budget, i.e. £50, pupils could access top up funds to purchase a birthday cake!

First pupils had to think about the usual snacks and drinks at a birthday party for a ten-year-old. The teacher encouraged discussion around which are most popular and which are the healthiest before the pupils were given their food and drinks budget.

A selection of different items (using photos and empty packaging) was provided and pupils were encouraged to think about other people's preferences as well as their own, to help them understand that not everyone may make the same decisions.

Pupils then had to choose the food and drink items they wanted for their birthday parties and then work out how much they needed of each item to feed all their guests. Finally, they wrote a shopping list for everything they would need to buy.

The teacher gave each group some replica money to give them hands on experience of using coins and notes, and price lists for each of the items at different shops. The pupils then went 'shopping'; as part of this activity they had to shop around looking for the best deals on the items they had chosen.

To extend the activity ideas in this case study, you could try the following;

Create shops that offer food products in different sizes, e.g. a pack of 6 or a pack of 10, so the pupils have to make decisions about how many packs of certain items to buy in order to make sure they have enough for 30 guests. Sometimes this may mean buying more than needed in order to ensure they have enough. They would need to calculate how their budget was affected by having to buy more than they actually needed because of pack sizes, and adjust their shopping list accordingly.

This particular element of the activity can help pupils to understand the value of money, and that own brand products or multi buys in a supermarket can sometimes be cheaper. The pupils can use their replica money to purchase the goods once they have decided which deal is most beneficial to their budget. The use of tangible money and being able to see the items they are purchasing can give these tasks a higher level of engagement.

> It was great to use the real money."
>
> Year 5 pupil

ACTIVITY IDEA...
COINS, COINS, COINS!
KEY STAGE 1

Learning outcome:

- to recognise and select coins to make up a specified amount

Ask pupils how many of the following amounts can be made using just 2p coins; 6p, 15p, 22p, 51p, 90p.Then ask pupils to consider which of the amounts, for example 20p, 15p, 18p, 32p, 46p, 85 p, £1, £1.20 they could make using only 1p coins, and then 2p coins and 5p coins.

Next ask pupils to work out how many of each coins they would need to make specific amounts, for example how many 10p coins do you need to make 20p?

Record findings in a table such as the following;

Amounts	Make using 1p Yes /No	How many coins?	Make using 2p Yes /No	How many coins?
20p				
15p				
18p				

ACTIVITY IDEA...
BIRTHDAY SPENDING
KEY STAGE 1

Learning outcome:

- to experience making spending choices to begin to appreciate that they may not have enough money to buy everything that they want

Provide pupils with the scenario of needing to buy some presents for a friend's birthday, they have £5 to spend and can choose from the following items;

Cuddly toy	£2.50
Football	£1.90
Toy train	£1.50
Bucket and Spade	99p
Sweets	50p

Ask pupils to explore how many ways they can find to spend £5. They do not need to spend all the money; however, they cannot spend more than the £5. For example, they could buy a toy train, a football and sweets costing £3.90 or they could buy two cuddly toys costing £5. Differentiate the task by using simpler amounts and fewer options.

Finally, ask pupils to find how many ways they can buy 3 presents. What are the presents and the cost? What is the least they could spend and what is the most they could spend?

Extend this activity by asking pupils to consider how many ways they can buy 4, 5, or 6 presents respectively. What is the least they could spend and what is the most they could spend for each option?

ACTIVITY IDEA...
POCKET MONEY
KEY STAGE 2

Learning outcome:

- to know that we can earn money by working

- to understand that they might need to save up in order to buy something they want

Use the following scenario for pupils to consider earning some pocket money; you need to earn some extra money to buy some presents and your parents have offered to pay you for doing various household chores as listed below;

Cleaning your bedroom	£2.00 per week
Tidying, vacuuming and polishing the lounge	£1.50 per week
Gardening	£1.50 per hour
Cleaning the car	£2.00 per car
Washing the dishes after dinner	£1.00 per evening
Emptying rubbish bins	£0.50 per week

Ask pupils to consider what chore they would choose and why.

Next, ask them to work out what they would earn in total from cleaning their bedroom, emptying bins and washing the dishes after dinner for a whole week?

Alternatively, ask them to calculate how much they would earn by washing dishes for three nights, cleaning two cars and working in the garden for two hours.

Discuss with the class how long some of these tasks would take and what the maximum they could realistically earn each week.

### Ask them to think about buying presents for family, for example:

- some flowers costing £6. What is the least or most number of jobs they will need to do?

- buying a toy doll costing £55. What jobs would they choose to do? And for how many weeks will it take to save the amount?

- buying a bicycle costing £120 for a sibling, what chores will they need to do in order to buy the bicycle in 3 months?

Encourage pupils to write some further scenarios for each other, with assigned costs, and calculate their earnings.

ACTIVITY IDEA...
BAKE ME A CAKE
KEY STAGE 2
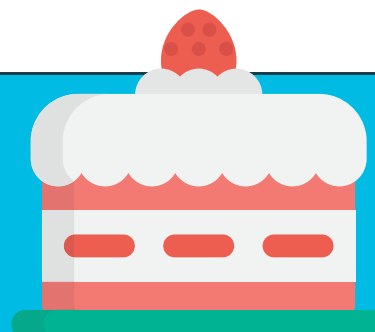
Learning outcome:

- to use a range of information to help manage money and make decisions

- to appreciate that the purchase price of an item will be more than just the cost of the materials/ingredients

Set the scene that pupils will make and sell cakes at the school fair to raise some money for charity.

Provide the pupils with the list of ingredients needed to bake some cupcakes; 1kg bag of self-raising flour, 2 boxes of 12 eggs, 1kg bag of caster sugar, 1kg tub of margarine and 2 packets of 100 cupcake cases.

Ask pupils to estimate the costs of each of the items before researching the actual costs online or presenting them with the receipt.

Then present pupils with the following recipe that makes 12 cupcakes:

- 115g caster sugar
- 115g self-raising flour
- 115g margarine
- 2 eggs

In groups ask the pupils to consider the following questions;

- How much does each cake cost to make?

- What should be the selling price of each cup cake?

- How much money will they raise if they sell all the cakes?

- How many cupcakes can they make if they used all of the ingredients on the list you had given them?

Share their answers with the whole class – what was the lowest/highest selling price for each cup cake? How much do they think people would realistically be willing to pay?

Differentiate the task by using smaller packets of initial ingredients and simpler costs or extend for more advanced pupils by changing the recipe to make something involving more ingredients, or by asking pupils to come up with special offers for selling their cupcakes.

Q1 Write in the missing amounts in this sequence.

The same amount is added each time.

£2.15	£2.25	£	£	£	£2.65	£

Q2 Justin wanted to buy a cake for 75p.

75p

He has 50p

How much more money does he need?

p

Q3 Dwain needs 27 paper cups.

They are sold in packs of 5.

How many packs does he have to buy?

packs

Q4 Look at these amounts...

£60.06   £6.60

£6.06   £60.60

Write the amounts in order in the boxes.

£	£	£	£

least   **most**

Q5 Kerry is saving to buy a bike that costs £105.

She saves £10 every week.

How many weeks will it take her to save enough to buy the bike?

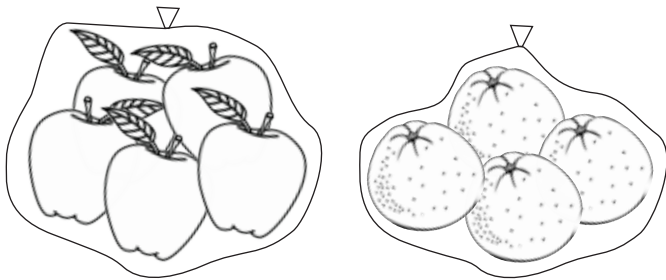| **weeks** |
|---|

Q6 Khalid has some 20p coins.

He has £3.40 in total

How many coins does he have?

coins

Q1 A bag of 5 apples cost £1.
A bag of 4 oranges costs £1.40.

How much more does one orange cost than one apple?

Show your method...

Q2
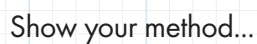
A	B	C	D	E
£235,300	£191,125	£231,495	£235,500	£199,500

Put these houses in order of price starting with the lowest price.
Use the letters A, B, C, D and E.

Lowest   **Highest**

Q3 Susie buys three packets of crisps.

She pays with a £2 coin.
This is her change.

What is the cost of one packet of crisps?

✏️ Show your method...

Q4 Wenwen has some money.
She spent 65p on a drink and £2 on a sandwich.
She has three quarters of her money left.
How much money did Wenwen have to start with?

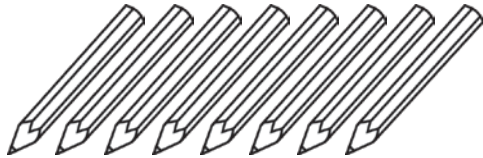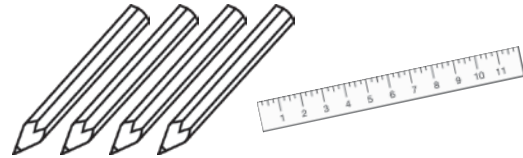✏️ Show your method...

£

Q5 8 pencils cost £2.24.   4 pens and a ruler cost £1.47

What is the cost of the ruler?

Show your method...

Q6 Write the missing number

Original price
£80

Now only
£60

Reduced by ____ %

Q7 Alfie has saved up for a new bicycle that costs £120.

The table below shows how much money he saved each month.

Month	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov
Amount saved	£15	£ 12	£ 6	£ 12	£ 9	£ 12	£ 18	£ 12	£ 9	£15

In which month did Alfie reach half the amount he needed for the bicycle?

If Alfie had saved an extra £3 each week, in which week would he have reached his target of £120?

Q8 Mo wants to buy some pop.
He sees the following packs in the supermarket.

Pack of 4 cans
£1.20

Pack of 6 cans
£1.70

Mo wants to buy 12 cans. Which deal is cheaper? Explain your answer.

STATISTICS

AND THE CONTEXT OF MONEY

Young people encounter mathematical information on a daily basis and in a range of different forms. In class we sometimes encourage pupils to construct graphs of their favourite colour, car or food.

However, in order to keep pupils interested it is necessary for them to see the purpose of such graphs. The biggest challenge is choosing interesting and appropriate questions for pupils to explore.

Statistics has many real-life uses that can be easily related to money, and some of the daily data that pupils encounter can be used as exercises to help children learn how to interpret and understand both money and statistics.

For example;

- What prices should the food in the school canteen be?

- How many young people have a mobile phone and how much does it cost?

- How do pupils travel to school and how much does it cost?
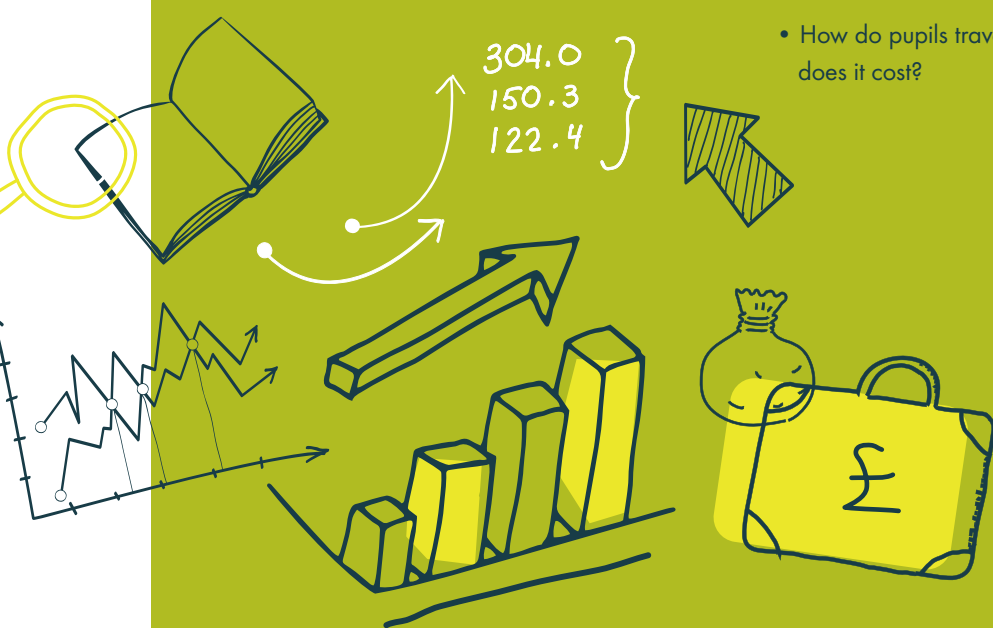
CASE STUDY
COVERING ALL BASES!

St John Fisher Catholic School in Harrow wanted to teach their Year 5 class a wide range of mathematics skills set within a financial context. Eight financial education maths lessons were planned, one of which explored statistics.

The objectives:

- to interpret and create graphs based on real-life data

- to investigate a statement by interpreting data

What they did:

In the lead up to the lesson pupils had the opportunity to recap on key maths skills, including calculating averages, drawing graphs and interpreting data from graphs.

The lesson began with a starter activity. Pupils were given a picture, such as a till receipt, or a menu in a coffee shop, and then asked to generate questions such as how many items at 40p have been bought, or how many items are priced under £1.

The main activity focused on the story of customers in a local coffee shop. The coffee shop had collected data from approximately 50 customers between 9 and 11am on a midweek morning in September, including information on gender, age, occupation, arrival time and money spent.

Pupils were encouraged to explore the data provided; using questions such as; What age were the oldest or youngest person who came in the shop? What was the largest amount spent? What were the occupations of those who came into the shop, and how many were there?

Pupils then formed hypotheses on the data to justify their thoughts. For example, more males came into the shop than females, more students came into the shop than any other occupation, older people spent more money than younger people did, the average amount spent was £4. Pupils had to answer their own questions by doing calculations and drawing appropriate graphs from the information.

Finally, pupils had to consider what they could deduce about, size and clientele of the shop, and what other information would have been useful to collect.

As part of the financial maths lessons key vocabulary was introduced and discussed. Pupils were very interested in understanding the meaning of words such as receipt, and this provided a rich background for developing their knowledge.

> "I think these lessons are worth it because it will help when I am older."
>
> Year 5 pupils, at St John Fisher Catholic School

COFFEE SHOP DATA
KEY STAGE 2

The information below was collected by a coffee shop at the edge of the town centre between 9 and 11 am on a Wednesday morning in late September.

What information can you deduce about the location, the shop and the shop's clientele? Is there a particular market that the coffee shop should aim at? What other information would have been useful to collect?

Sex	Age	Occupation	Arrival time	Amount spent
M	24	Admin Assistant	08:00	£2.55
M	45	Accountant	08:02	£1.99
F	68	Solicitor	08:05	£2.50
M	45	Mature Student	08:06	£1.99
F	12	Schoolgirl	08:10	£3.50
F	17	Shop Assistant	08:11	£4.25
F	89	Retired	08:13	£1.99
F	56	Market Trader	08:14	£3.50
F	45	Salesperson	08:16	£7.55
M	78	Retired	08:17	£2.50
M	12	Schoolboy	08:20	£2.50
F	56	Unemployed	08:21	£1.25
M	35	Nurse	08:22	£2.25
F	12	Schoolgirl	08:25	£1.25
F	65	Legal Secretary	08:28	£2.80
F	23	Unemployed	08:32	£3.45
M	24	Self Employed	08:37	£8.75
M	29	Electrician	08:40	£6.50
M	35	Teaching Assistant	08:42	£3.50
F	40	Nurse	08:50	£6.25
F	41	Nurse	08:51	£6.25
M	48	Nurse	08:52	£6.25
F	50	Nurse	08:53	£6.25
M	58	Office	08:57	£4.25

Sex	Age	Occupation	Arrival time	Amount spent
M	56	Shop Manager	09:05	£1.99
F	25	Secretary	09:12	£10.98
F	23	Admin Assistant	09:18	£5.50
F	21	Student	09:24	£3.50
F	18	Student	09:25	£2.50
F	17	Trainee Cashier	09:34	£1.99
F	15	Schoolgirl	09:38	£2.65
F	19	Shop Assistant	09:44	£3.30
F	21	Admin Assistant	09:50	£4.20
F	28	Legal Executive	09:58	£5.25
M	38	Surgeon	10:02	£4.75
F	41	Housewife	10:12	£7.60
M	35	Solicitor	10:15	£1.99
M	31	Electrician	10:18	£2.99
F	41	Housewife	10:20	£7.75
F	44	Manager	10:26	£5.50
N	46	Nurse	10:31	£2.50
F	55	Shop Assistant	10:37	£2.25
F	33	Brick Layer	10:43	£5.00
M	28	Site Foreman	10:50	£4.25
F	54	Writer	10:53	£7.25
M	20	Student	10:55	£5.00
M	24	Student	10:56	£2.50
F	21	Student	10:57	£2.50

ACTIVITY IDEA...
HOW MANY COINS?
KEY STAGE 1

Learning outcome:

• to recognise different coins

• to appreciate the relative value of different coins

Put a range of coin denominations inside a bag; for example, 5 lots of 50p coins, 10 lots of 2p coins, 7 lots of 5p coins. Ensure that the pupils cannot see the coins!

First ask the pupils to consider what the coins could be? Then ask a pupil to pick out a random handful of coins without looking (for example 50p, 50p, 2p, 2p, 2p, 2p, 5p).

Then ask them to count the number of coins, draw a pictogram of the coins and add the coins to find the totals from their graphs. This could be completed in small groups or as a class.

Alternatively, as a class, ask pupils to pick out a coin each recording their answers on a tally chart, and then draw a bar chart to represent the information. Ask the pupils to discuss what they can conclude from the graph; for example, do they think there are more 5p coins than any other coins? Can we tell how much is in the bag? Can we tell which particular coins are in the bag?

ACTIVITY IDEA...
HOW MUCH IS MY POUND WORTH?
KEY STAGE 2

Learning outcome:

- to know that money has different values in different countries

- to begin to appreciate that we can 'exchange' our currency for that of another countries

Explain to pupils that in the UK we use pounds and pence as our currency, then ask if they are familiar with any currencies used in other countries.

Encourage them to consider questions such as; is £1 worth one of the currencies used in other countries? For example, is £1 worth 1$ or is £1 worth €1and so on.

How might pupils know what £1 is worth in the different countries and where would they go to find out? Does the value of £1 change, if so how often? Show an example of a currency conversion table to illustrate this information.

Working in small groups or as a class and using an online currency convertor, ask pupils to convert the following pounds into three different currencies of their choice; £1, £10, £50, £100, £500 and rounded to the nearest whole number.

Then task the pupils to draw a currency conversion graph for their findings. Use a consistent 'x' axis to represent pounds, and use each of their three chosen currencies for the 'y' axis.

Ask pupils to use their graphs to work out the value of £25, £125, £250 in each of the currencies. Use an online currency convertor to check their answers.

Extend this activity by giving pupils the scenario of a round the world ticket, with which they must visit five countries of their choice. In each country, they must visit a landmark attraction for example, the Eiffel Tower in France, or the Taj Mahal in India, or the Great Wall of China.

The round the world ticket includes flights to five countries of their choice, however they will be staying in each country for four nights, and will need to research the average mid-range costs of hotels, food, travel and entrance to their landmark attractions.

Ask pupils to approximate the amount of money they will need in each currency to take with them, justifying the choices they make.

To differentiate this activity, pupils could use £60 as an approximate cost of a hotel per night, food costing £25 per day with travel and entrance to attractions estimated at £50. Alternatively, pupils could be given details of 3 online hotels, two food options for evening meals (given the hotel will provide breakfast, and they will buy a sandwich for lunch) and a fixed travel and attraction entrance approximation.

ACTIVITY IDEA...
FITS LIKE A GLOVE!
KEY STAGE 2

Learning outcome:

- to understand that the price of an item may affect whether we buy it or not

- to know that before we buy we might need to find out more about a product

Introduce the scenario that the pupils are starting a school glove company! Pupils will initially need to consider what sizes to make the gloves, to make decisions they will need to conduct a measuring survey of the class.
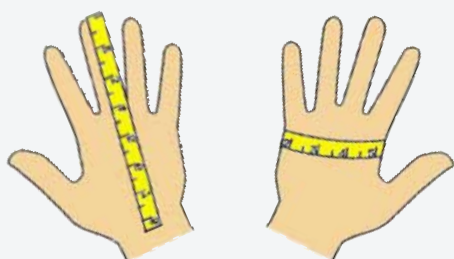
Ask the pupils to draw and measure their own hand sizes. First measure from the base of the palm to the tip of the longest finger as in the first diagram below, then measure around the largest part of the hand over the knuckles (excluding the thumb) as in the second diagram.

Encourage pupils to consider how they will collect their data, and what units they will use. Differentiate by using a tally chart with, for example, five equal class intervals estimated from the largest hand to the smallest hand in class. Ask pupils to draw suitable graphs to represent the data, and calculate the averages.

Using their findings, ask pupils to make recommendations for the size of the gloves for their age group. Prompt pupils to consider what other age groups/sizes they will need to cater for and how they will label their gloves, for example small, medium or large, or alternatively label by labelling age group.

Ask the pupils to consider at what price they should sell their gloves. They will need to do some research, such as writing and completing a questionnaire with parents and carers to find out what a customer is prepared to pay. Ask pupils to collate and present this data using suitable graphs to show the averages calculated and present their findings of sizes and prices of their gloves justifying their decisions.

Finally ask pupils to consider what other factors might influence our choice of gloves apart from price, they should think about what material they are made from, if they can be washed, how warm they will keep our hands, ease of getting on and off and so on.
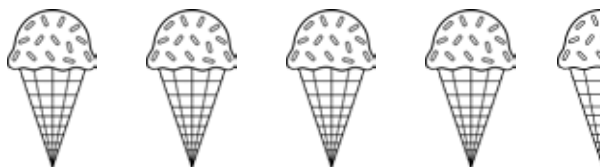
Q1 The pictogram shows the number of ice creams a shop sold in a day.

 stands for **10 ice creams**

Vanilla

Strawberry

Chocolate

How many vanilla ice creams were sold?

Which flavour was the mode?

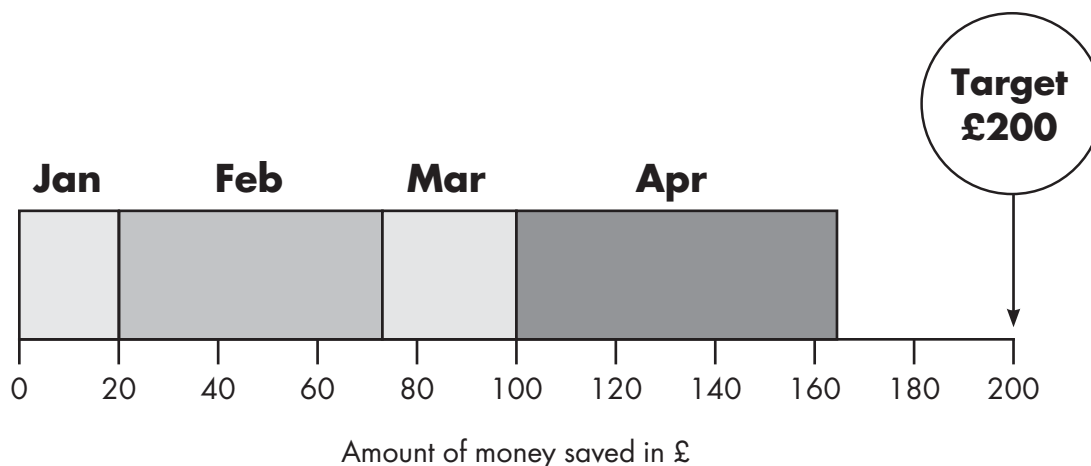How many more chocolate than strawberry ice creams were sold?

How many ice creams were sold in total?

STATISTICS - ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q2 Mei is saving up for a new mobile phone, which costs £200
The chart shows how much she has saved since January.

| Jan | Feb | Mar | Apr |

Target £200

0   20   40   60   80   100   120   140   160   180   200

Amount of money saved in £

In which months did she save least and the most?

Least ....   **Most** ....

How much money did they collect in February and March altogether?

£ _____

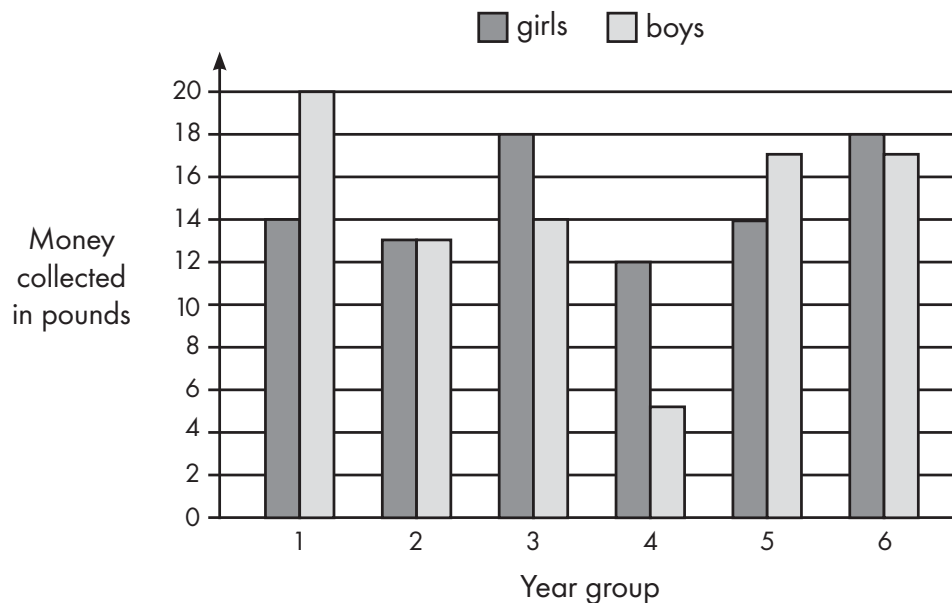Approximately how much more money does she need to save to reach her target?

£ _____

Q3 Pupils from six year groups collected some money for charity.
The chart shows how much the girls and boys collected.

In which year group did the girls and boys collect the same amount of money?

Year

In Year 4, how much more money did the girls collect than the boys?

£

Which year groups collected less than £30?

Years

Q4 A survey asked people in a village if they used the village post office or the town post office, or both. The bar chart shows the results.

Altogether 235 people took part in the survey.

How many people use both village and the town post office?
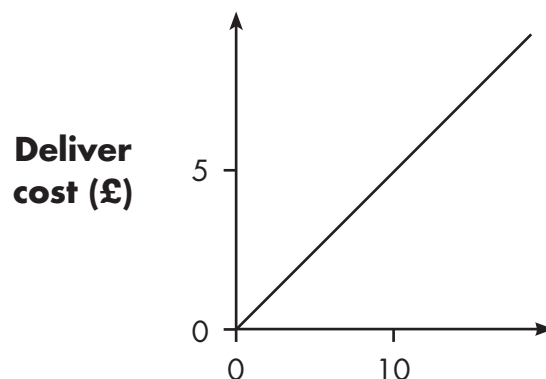
Show your method...

people

Q5 Two companies sell books online. They each charge to deliver.
Complete the sentence to describe the delivery cost for each company.

Deliver cost (£)

The more the books costs ....

....

....

Q6 Mr and Mrs Kowalski want to go on a trip with their two children.
The table shows the cost of coach tickets to different cities.

		Hull	York	Leeds
Adult	single	£12.50	£15.60	£10.25
	return	£23.75	£28.50	£19.30
Child	single	£8.50	£10.80	£8.25
	return	£14.90	£17.90	£14.75

What is the cost for a return journey to York for the family?

£

How much cheaper is it for the family to travel to Leeds than York?

£

Q7 The average price of bananas in a supermarket is 70 pence per kilogram. On average, each person in the UK eats 10 kilograms of bananas a year – about 100 bananas.
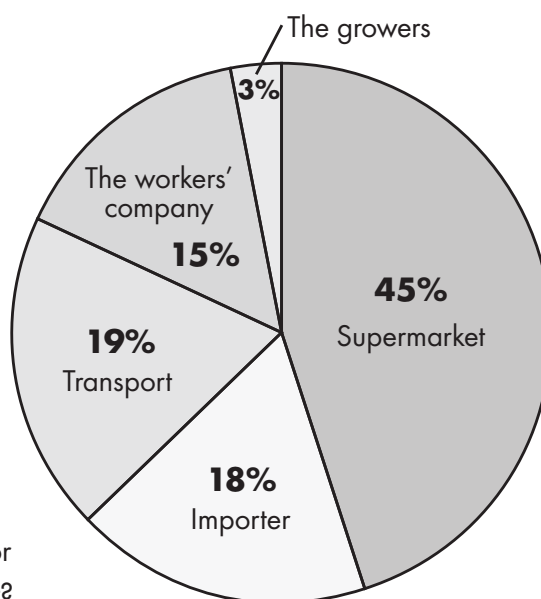
Approximately what is the mass of one banana? Give your answer in grams

	g

How much money does each person spend on bananas per year?

£	

The pie chart below shows who gets the money from the sale of bananas

Pie chart: The growers 3%, The workers' company 15%, Transport 19%, Importer 18%, Supermarket 45%

How much of the money each person pays for bananas in one year goes to the supermarket?

Show your method...

	p

$$x^2 + 3 = 7$$

ALGEBRA

AND THE CONTEXT OF MONEY

Algebra is an area of mathematics usually introduced in Key Stage 2. However, simple forms of algebra are used from Early Years and Foundation Stage onwards.

Algebra is present in teaching pupils to count in steps and make predictions of further numbers, or when asked to group common shapes. Pupils progress to counting in steps with negative number sequences, working with square numbers, generalising about odd and even numbers, and progressing to using simple formulae.

Supporting the development of algebra involves teaching pupils to understand the vocabulary needed to describe spatial patterns, number sequences, and how we can learn to generalise from them. Algebra is firmly rooted in patterns and the extension of these patterns, and this needs to be the starting point for pupils learning, in order to help them use variables in equations to find the values of unknown numbers.

Helping pupils understand how algebra is present in everyday real-life situations is one way to aid learning. For example, algebra is present in basic tasks such as cooking, by using simple algebraic expressions to adjust ingredients amounts based on the number of portions required. Likewise, this also relates to the context of money, and the costs per person.

ALGEBRA AT KEY STAGE 2

CASE STUDY 1
MONEY DOESN'T HAVE TO BE A PROBLEM!

Another of the 12 primary schools involved in Year One of the project taught Year 4 pupils about the real-life application of managing money, related to the foundations of algebra. The lesson focus was on providing real-life, contextual challenges based around financial decision-making.

The objectives:

- to be able to plan and budget spending a given amount of money
- to compare prices and make decisions according to need and budget available

What they did:

The teacher tasked the pupils to restock the class wet play cupboard for a budget of £50. However, there needed to be a group consensus on the items they chose. Eventually pupils were required to calculate the best options; considering interest rates, payment by installments and other factors.

Initially the teacher helped the group identify the important role money plays in our everyday lives and discussed the impact poor financial awareness can have. Pupils shared their everyday experiences of money, and then the group discussed what would happen if they did not have enough money for the things they needed.

Working in groups and using a shopping catalogue and the £50 budget, pupils were asked to discuss and agree items to replace the resources in the wet play cupboard. Pupils brainstormed the items they thought would be most useful and that could be purchased within their budget.

Next they calculated the expenditure and any remaining funds, and as a class discussed and debated the products they thought would be most appropriate and cost effective.

The real-life scenario and premise of the lesson engaged pupils, with all groups accurately calculating their expenditure and all managing to utilise their budget effectively to spend between £48 and £50.

During a further lesson, pupils were asked to give advice on selecting a new furniture set (sofa and armchair) for the head teacher's office. Pupils were given a range of furniture store products which including package payment deals, which included various deposit requirements and interest rates.

After discussing various deals, pupils had to calculate the cost of the furniture for each of the different options. Some pupils were able to calculate the cost of the furniture if paid on a monthly or weekly basis, which involved logically breaking down the cost into monthly/weekly figures and calculating the interest charged, using early algebra skills. The pupils responded extremely well to this lesson and were very excited to complete what they considered an 'adult task'.

Extend this activity to consider if saving up for something first makes more sense than buying on credit. How much more will they pay if they borrow the money rather than saving up? What might happen if we can't pay back the money we owe?

I'll be the one doing the furniture shopping from now on!"

Year 4 pupil

ACTIVITY IDEA...
POSTAGE

Learning outcome:

- to interpret data in order to make financial decisions

Ask pupils for their help in posting some parcels to your family who live in a range of locations across the UK.

Show the pupils various parcels, which include a variety of sizes and weights. Pick out a couple of parcels to show to pupils, including a large parcel that has a small mass and a small parcel that has a large mass.

Next ask the pupils to consider how much it will cost to post these parcels? What will the post office need to consider?

Through discussion establish that both size and mass needs to be considered in order to cost the delivery of a parcel. Ask pupils to estimate the mass of the two parcels including considering which units they would use.

Set up parcels and weighing scales around the room. Ask pupils to measure the length, width, depth and weight of each parcel and record their answers in a table such as the following;

Parcels	Length (cm)	Width (cm)	Depth (cm)	Weight (KG)
1				
2				

Introduce the UK size and weight guide for parcels which helps classify the sizes of parcels;

Parcels	Not exceeding Length (cm)	Not exceeding Width (cm)	Not exceeding Depth (cm)	Weight limit (KG)
Small	45	35	16	2
Medium	61	46	46	20

As a class or in small groups, ask the pupils to use the table above to classify the parcels as small or medium.

Then ask pupils to consider what happens if their parcel was greater than 20Kg or greater than 61cm in length?
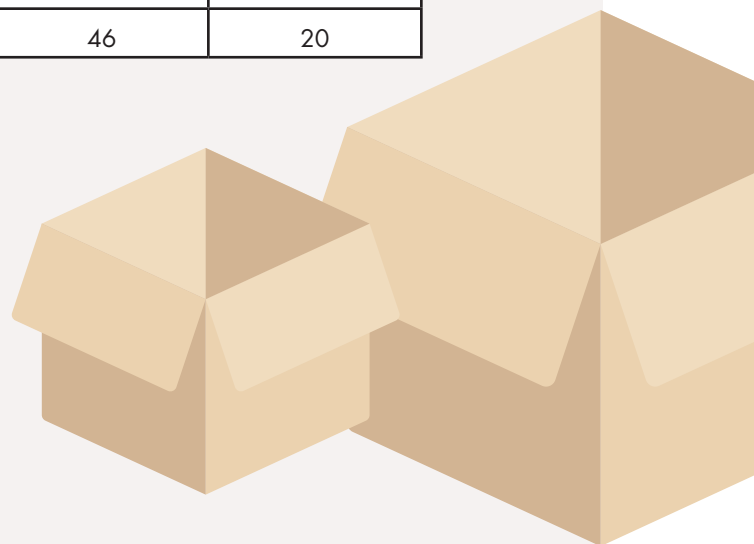
Finally ask pupils to find the cost for posting each parcel, first and second class, and to consider what the saving would be of posting all the parcels second class rather than first class.
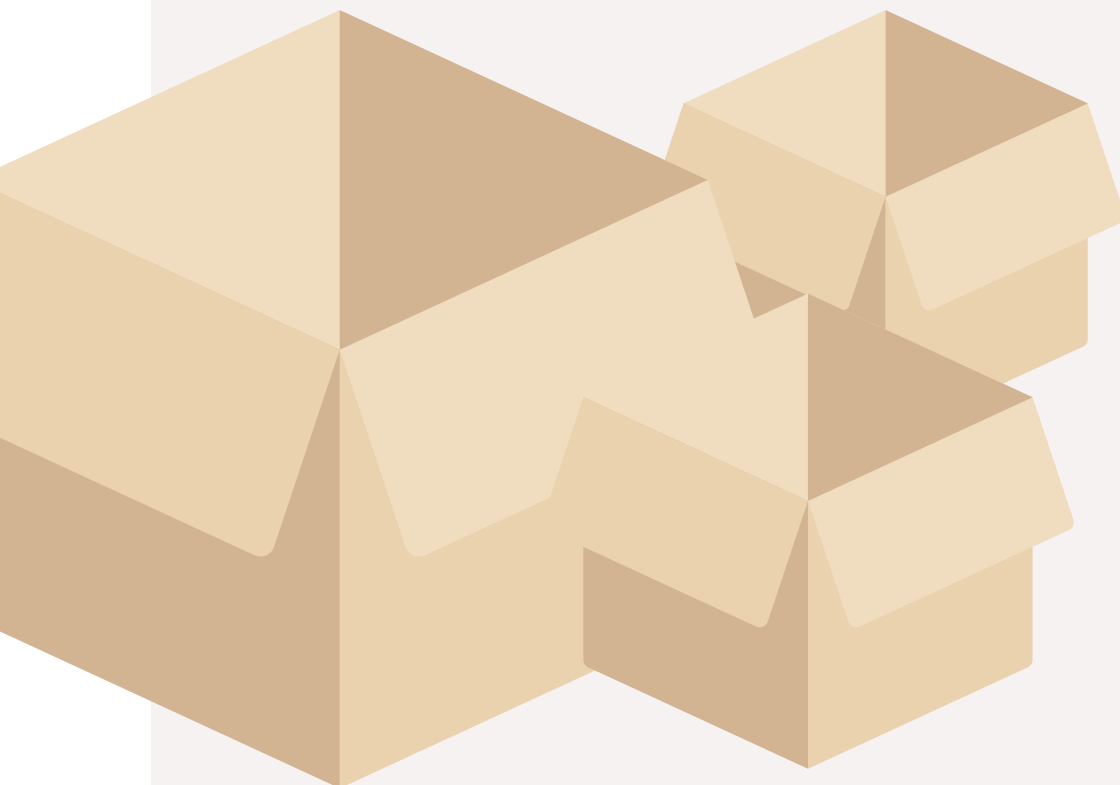
	Weight up to & including (Kg)	1st class Price	2nd class Price
Small	1	£3.40	£2.90
	2	£5.50	£2.90
Medium	1	£5.70	£5.00
	2	£8.95	£5.00
	5	£15.85	£13.75
	10	£21.90	£20.25
	20	£33.40	£28.55

Extend this activity by asking pupils to calculate the cost of posting a number of parcels of a particular size.

For example,

- to calculate the cost of posting 2 small parcels under 1kg in second class post could be calculated by 2 x £2.85,

- to calculate the cost of posting 5 small parcels under 1kg in second class post could be calculated by 5 x £2.85,

- to calculate the cost of posting 'n' small parcels under 1kg in second class post could be calculated by 'n' x £2.85.

For further extension give pupils a large parcel that requires measurements of length and girth combined. Ask pupils to research how to calculate the girth and then write this as a formula using letters.

ALGEBRA AT KEY STAGE 2

ACTIVITY IDEA...
BIKING AROUND LONDON

Learning outcome:

- to know that planning spending can help you stay in control of your money

- to use financial data to work out pricing variables

Using the scenario of a day trip to London, explain that you will be biking around the city, and want to visit some friends and family (for example an Aunt in Stanmore and old school friend in South Croydon) as well as some tourist attractions.

Ask pupils to list tourist attractions they think you should visit, for example Big Ben, Trafalgar square, Buckingham Palace, Hampton court palace, the Science Museum.

However, you cannot do all of them on the first day. Ask the pupils to pick two tourist destinations they think you should visit first and one family or friend destination where you will stay.

Ask pupils to help you calculate the cost of hiring a bike to get to these destinations, providing them with the following about the hiring scheme:

The starting point for your adventure will be Paddington Station. Pupils will need to use a map of London to identify the locations and estimate, using the map scale, the distance to each destination. They will then need to estimate the approximate time it will take to cover each journey given that the average bike speed is 18 miles per hour.

Ask the pupils to calculate the cost of each journey, given you dock the bike at each destination, so only need it for travelling time.

To differentiate, ask pupils to work with one tourist destination with a given distance.

To extend this activity ask the pupils to recalculate the cost of each journey, given you visit two tourist destinations per day and stay over at a family or friend's house.

"Simply hire a bike in London, ride it where you like, then return it to any of the hundreds of docking stations across the city. It costs £2 to access the bike for 24 hours, and the first 30 minutes of each journey is free. After that it costs £2 for each extra 30 minutes".

ALGEBRA - ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q1 The cost to hire a bicycle is worked out using the information below.

> **Cost to hire a bicycle is £2 per bicycle**
> ──
> **and then a further £2 for every 30 minutes**
> ──
> **(however the first 30 minutes is free)**

Sami hires a bike for five hours.
How much does he pay?

Show your working...

£

Filip hires a bicycle and pays a total of £14
How many hours did he hire the bicycle for?

Show your working...

hours

Q2 Ali has five coins.
Three of the coins add up to 30p.
Three of the coins add up to 20p.
All five coins add up to 90p.

What are the coins that Ali has?

p	p	p	p	p

Q3 Deepak bakes and sells cakes.

He uses this formula to work out how much to charge for the cakes in a box.

> **Cost = number of cakes x 30p + 15p for the box**

How much will a box of 12 cakes cost?

£

Selena buys a box of cakes for £6.15
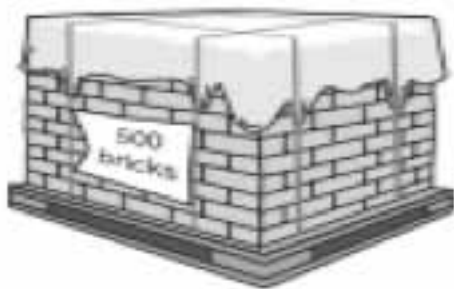How many cakes are in the box?

Show your working...

cakes

ALGEBRA - ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q4 A builder needs 9600 bricks to build a wall. There are 500 bricks in a load.

How many loads should the builder buy?

The price of the load of 500 bricks is £250.
Describe how you could work out the cost of one brick.

What is the cost in pence of one brick?

Q5 Martel has 6 coins that make 90 pence.
The coins are of only two different kinds.

What are the coins?

p	p	p	p	p	p

Q6 Priya had some photographs printed.
The cost for printing each photo was 15 pence.
The cost of postage was £3.35

She uses this formula for the total cost in pence

$$\text{Cost} = 15n + 335$$

'n' stands for the number of photographs

Priya pays £5. How many photographs does she have printed?

Show your working...

ALGEBRA - ASSESSING LEARNING THROUGH KS2 TEST STYLE QUESTIONS

Q7 A cake costs 25p more than a biscuit.
If **b** is used for a biscuit.

How could you write the cost of a cake using **b**

Millie bought a cake and
two biscuits for **£1.45**

How much does a cake cost?
How much does a biscuit cost?

Show your working...

Cost of a cake

p

Cost of a biscuit

p

DEVELOPING FINANCIAL CAPABILITY THROUGH MATHEMATICS:
NOTES

Thank you to all the primary schools that took part in the first year of the project and their associated lead teachers;

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Moriah Day Jewish Primary School

St Anselm's Primary School

St John Fisher Primary School

St Mary's and St John's Primary School

St Stephen's CE Primary School

William Tyndale Primary School

About Young Enterprise

Young Enterprise is the UK's leading charity that empowers young people to harness their personal and business skills. We work directly with young people, their teachers and parents, businesses and influencers to build a successful and sustainable future for all young people and society at large.

About Nationwide

Nationwide has been providing free financial education for a number of years through a range of programmes including Nationwide Education which provides interactive educational tools to help children and young people to develop important life skills.

Financial Education Quality Mark

Financial Education Quality Mark is an accreditation system for financial education resources that have been created for use with children and young people. It is awarded to resources that support high quality teaching and learning about money. It gives those delivering financial education the confidence that the materials they are using are of the highest educational value and contain accurate and up-to-date information for young people. To date, more than 120 resources have been awarded the Quality Mark, with many being re-awarded after the initial assessment. To find out more go to www.y-e.org.uk/qualitymark.

Free Advice and Guidance

ASKpfeg is a free support service, offering advice and guidance to those who are teaching children and young people about any aspect of financial education. To get in touch email: askpfeg@pfeg.org and someone will get back to you with practical information and ideas within two working days. For further information see www.y-e.org.uk/askpfeg

Visit the resources section of the website for lots more videos, case studies, resources, and guidance to help teach financial education;
www.y-e.org.uk/financial-education-resources